Artistry in Sound

ONKYO

A-8700/8500

Integrated Stereo Amplifier
Integrierter Stereo-Verstärker
Amplificateur stéréo intégré
Amplificador Estereofonico Integrado
Geïntegreerde stereoversterker
Integrerad stereoförstärkare
Amplificatore integrato

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• *Congratulations on your purchase of the ONKYO A-8700/8500 Integrated Amplifier.*
• *Please read this manual thoroughly before making connections and turning power on.*
• *Following the instructions in this manual will enable you to obtain optimum performance and listening enjoyment from your new A-8700/8500* • *Please retain this manual for future reference.*

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Features

- **High Power Output**
  Both these amplifiers deliver clean, low distortion power in abundance and can safely drive low impedance speakers.
  A-8700: 105 W/ch. (20 Hz – 20 kHz), 0.008% THD; 303 W/ch. dynamic power (2 ohms)
  A-8500: 80 W/ch. (20 Hz – 20 kHz), 0.008% THD; 210 W/ch. dynamic power (2 ohms)
- **Onkyo Exclusive AEI Transformer (Patent Pending)**
  Conventional transformers suffer from relatively high levels of electromagnetic flux leakage, and this can adversely affect the sound. Onkyo has developed a completely new type of EI transformer to remedy this defect. It uses a special core configuration and silicon steel shielding to minimize flux leakage from the core and coil. The result is an overall reduction in flux leakage of 22 – 27 dB compared with conventional EI transformers. (That's approximately 1/12 – 1/22 of previous levels.) In fact, during heavy loads, the AEI transformer produces even less magnetic flux than a toroidal unit. The result is lower distortion levels for purer, more musical sound.
- **Low Impedance, Tri-Terminal Regulators**
  Both these amplifiers employ only strictly selected parts. The voltage regulators used to suppress ripple voltage are one example. They stabilize even large fluctuations in voltage and are virtually unaffected by extremes of temperature or load. Ripple voltage is reduced approximately ten times more effectively than in conventional units. The output impedance is only about one-tenth of the level for previous designs. The highly stable regulated voltage output from these units constitutes an ideal power supply for the equalizer circuitry.
- **Source Direct Switch**
  This useful feature lets you enjoy the purest sound possible from any program source. Set the Source Direct Switch to DIRECT to bypass all the preamp section's tone control circuitry and switches, except for the dedicated volume control.
- **Opto-Drive Power Amplifier Circuit (A-8700 only)**
- **Super Servo**
- **Linear Switching Circuitry**
- **Delta Power Supply and Charge Noise Filter**
- **Four-Position Phono Cartridge Selector (MM,MM-Subsonic Filter, MC, MC-Subsonic Filter)**
- **Four-Block Shielded Construction**
- **Speaker Terminals Accept Banana Plugs.**

Important safeguards

"WARNING"

"TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE."

CAUTION

"TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL."

- For models having power cord with a polarized plug.

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

FOR POWER CORDS WITHOUT PLUGS (FOR BRITISH MODELS)

- Replacement and mounting of an AC plug on the power supply cord of this unit should be performed only by qualified service personnel.
- IMPORTANT: The wires in the mains lead are coloured in accordance with the following code:
  Blue: Neutral
  Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Observe the following precautions to obtain troublefree performance for many years.

1. Avoid places subject to direct sunlight or extremely high or low temperatures.
2. Avoid damp or dusty places and places directly affected by vibrations from the speakers. In particular, avoid placing the unit on or above one of the speakers.
3. Avoid unstable locations and high places from which the unit could fall.
4. Ventilation — The unit should be situated so that its location or position does not interfere with proper ventilation. For example, the unit should not be placed on a bed, sofa, rug of similar surface that could block the ventilation openings or placed in a built-in installation, such as a bookcase or cabinet, that could impede the flow of air through the ventilation openings.
5. Heat — The unit should be situated away from heat sources such as radiators, heat registers, or other appliances (including amplifiers) that produce heat.
6. Cleaning of the internal parts should be performed only by qualified service personnel.
7. Spillage — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through the openings.
8. Damage Requiring Service — The unit should be serviced by qualified service personnel when:
   A. The power supply cord or the plug has been damaged; or
   B. Objects have fallen or liquid has been spilled into the unit; or
   C. The unit has been exposed to rain; or
   D. The unit does not appear to operate normally or exhibits a marked change in performance; or
   E. The unit has been dropped or the enclosure damaged.
9. Servicing — The user should not attempt to service the unit beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

- This apparatus complies with requirements of EEC directive 82/499/EEC.

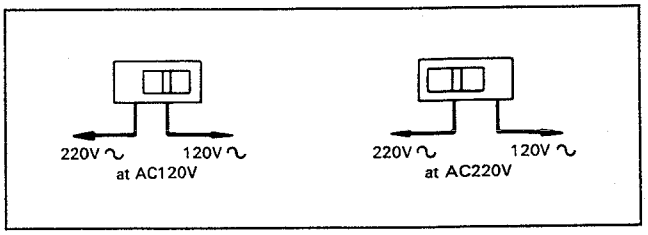
Precautions

1. **Warranty Card**
   The serial number is written on the rear panel of this unit. Copy the serial number and model number onto your warranty card and keep it in a safe place.
2. **Recording Copyright**
   Recording of copyrighted material for other than personal use is illegal without permission of the copyright holder.
3. **AC Fuse**
   The fuse is located inside the chassis and is not user serviceable. If power does not come on, contact your Onkyo dealer.
4. **Care**
   From time to time you should wipe off the front and rear panels and the cabinet with a soft cloth. For heavier dirt, dampen a soft cloth in a weak solution of mild detergent and water, wring it out dry, and wipe off the dirt. Following this, dry immediately with a clean cloth. Do not use rough material, thinners, alcohol or other chemical solvents or cloths since these could damage the finish or remove the panel lettering.
5. **Power**
   WARNING
   BEFORE TURNING ON POWER FOR THE FIRST TIME, READ THE FOLLOWING SECTION CAREFULLY.

- Some models are designed for use only with the power supply voltage of the region where they are sold.

European models (except U.K.):	AC220V, 50Hz
Canadian models:	AC120V, 60Hz
U.K. & Australian models:	AC 240V, 50Hz
Worldwide models:	120 and 220V switchable, 50/60Hz

- **Voltage Selector (Rear Panel)**
  Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on. Models without a voltage selector can only be used in areas where the power supply is the same as that of the unit.



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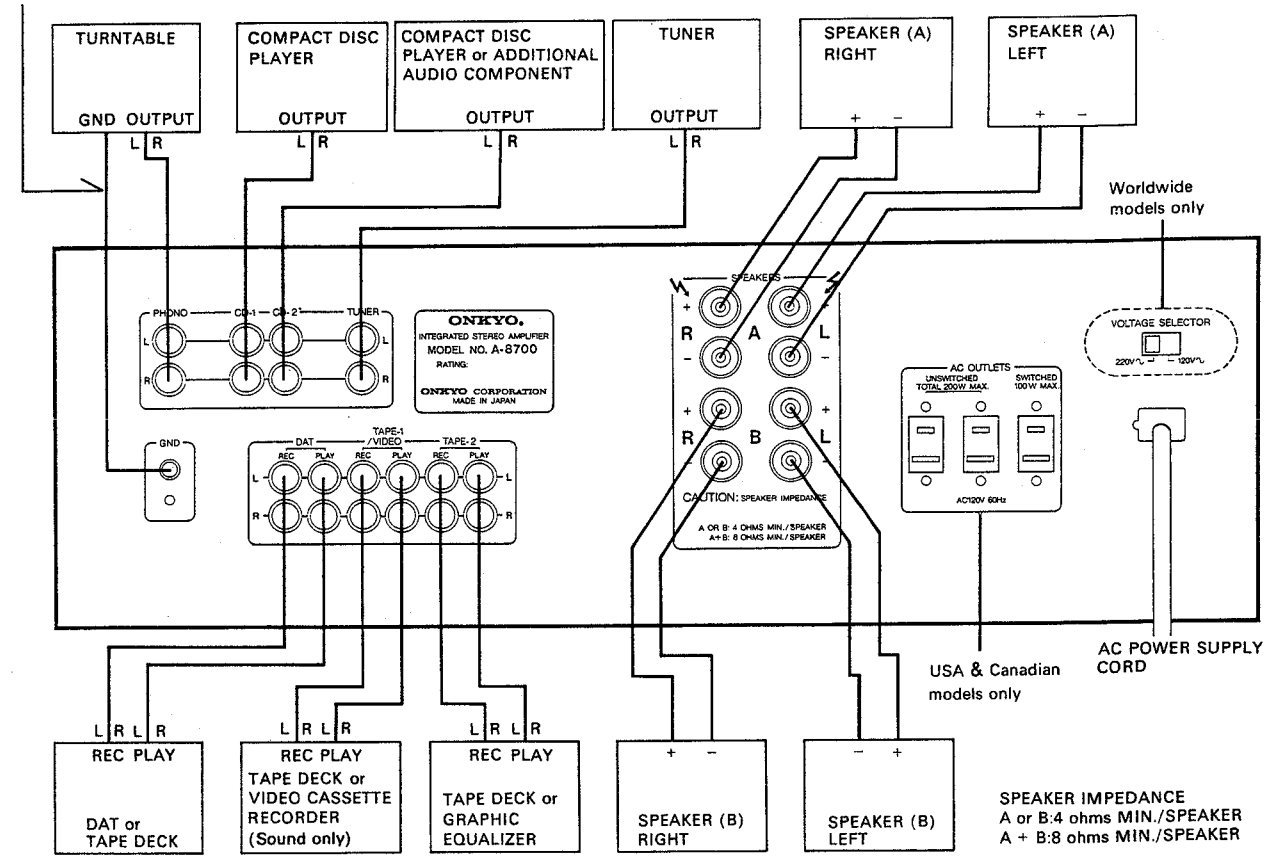
System connections

Do not plug in the power cord until all connections have been made.

Ground connection is not necessory for turntables without ground leads.



General

On each pair of input or output jacks, the lower jack (marked R) corresponds to the right channel, and the upper jack (marked L) to the left channel. When jacks on other equipment or connection cables are color-coded, the color red usually corresponds to the right channel (Red = Right).

Turntable Connections

Be sure to connect the ground (earth) lead wire from the turntable to the ground terminal (GND). Lack of proper ground connection will cause hum. Also observe the following precautions.

- Place the turntable on a firm shelf or desk free from vibrations (especially those generated by the speaker systems). If the turntable is permitted to pick up such vibrations, not only will this unit's performance suffer, but distortion in the bass range and howling noise in the speakers may also occur.
- Check the turntable instruction manual for any other precautions.
- The loud noises that occur when connecting and disconnecting the turntable leads could damage the speakers. Always turn the power switch off before making connections.

Tuner Connections

Connect an FM/AM tuner to the tuner input jacks. Be sure the left and right channels are connected properly.

Compact Disc Player Connections

Connect a compact disc player to the CD-1 or CD-2 input jacks. Be sure the left and right channels are connected properly.

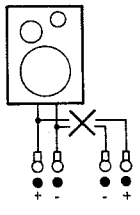
Tape Deck Connections

Three tape decks can be connected at once to this unit. "DAT" jacks can also be used for tape deck connections. Connect the tape deck output leads to the PLAY jacks and the tape deck input leads to the REC jacks of this unit. For more details, refer to your tape deck owner's manual. VCR sound input/output can also be connected.

Speaker Connections

When connecting speakers, proper polarity is important. Always connect the (+) terminal (red) on the amplifier to the (+) terminal on the speaker and the (−) terminal (black) on the amplifier to the (−) terminal on the speaker. Two separate pairs of speaker systems can be connected to this unit at once.

- The load impedance of each speaker system connected to this unit must be at least 4 ohms. (A or B−4 ohms min., A and B−8 ohms min.)
- When using only one speaker or when you wish to listen to monaural, the single speaker should never be connected in parallel to both the right and left channel terminals at once.



- Do not use unnecessarily long or extremely thin speaker leads. If the DC resistance of the speaker leads is too high, the damping factor will decrease.

Connecting Speaker Cables

1. Remove about 1/3 inch of insulation from the end of the speaker cable.
2. Twist the exposed copper strands together tightly.
3. Unscrew the speaker terminal part way by turning it counter-clockwise.
4. Insert the exposed copper portion of the cable all the way into the opening in the speaker terminal.
5. Tighten the terminal screw by turning it clockwise.
6. Check to make sure that none of the uninsulated copper portion of the cable is exposed.

CAUTION:

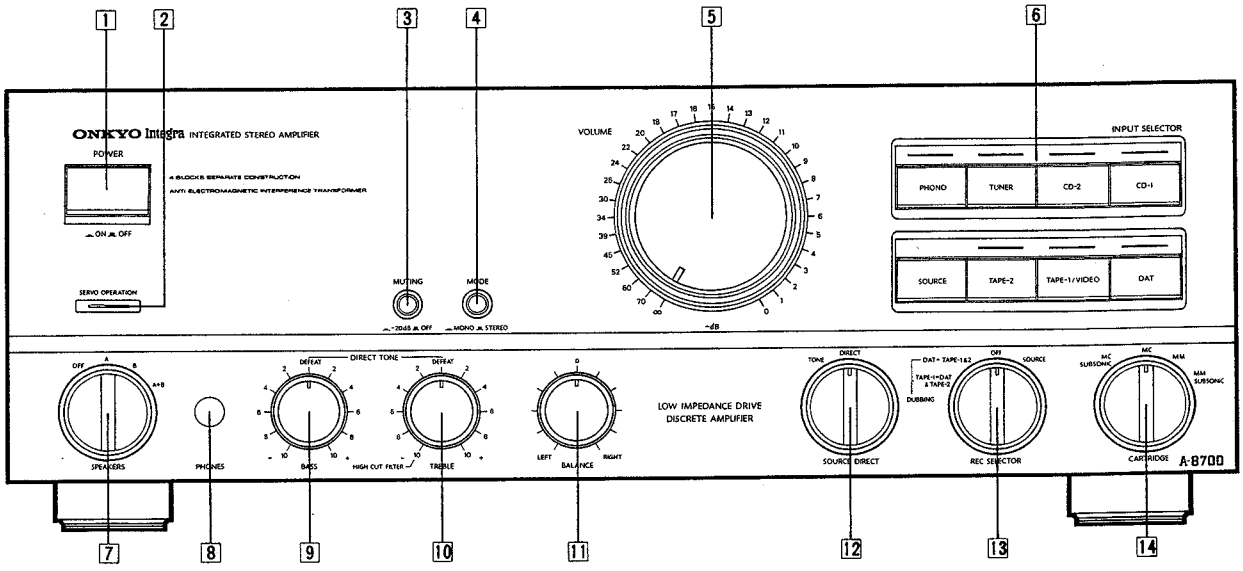
When using banana plugs, make sure the speaker terminal screws are screwed in firmly before inserting banana plugs.

AC Outlets (USA & Canadian models only)

- **UNSWITCHED:**
  These outlets are not switched on and off by the power switch on the front panel. Capacity is total 200 watts.
- **SWITCHED:**
  This outlet is switched on and off by the power switch on the front panel. Capacity is 100 watts (A-8700) / 50 watts (A-8500).

Front panel facilities

* Front panel description of A-8700



1 **Power Switch (POWER)**
Press once to turn the power on and once again to turn the power off. An orange band over the power switch indicates power is on.

2 **Servo Operation Indicator (SERVO OPERATION)**
A few seconds after the power is turned on, the Servo Operation indicator turns green to show that the Super Servo circuitry has stabilized. No sound will be heard until this indicator becomes green. When a problem such as a shorted output terminal circuit occurs during operation, the indicator goes off. Immediately turn the power off and consult an authorized serviceman.

3 **Muting Switch (MUTING)**
When this switch is set to the −20dB position, the volume level is reduced to one-tenth of the level set by the volume control.

4 **Mode Selector Switch (MODE)**
STEREO (▬): Position for normal stereo listening.
MONO (▬): Both right and left channel signals are sent to each speaker. Position for listening to monaural recordings or when adjusting the balance control 11.

5 **Volume Control Knob (VOLUME)**
Turn clockwise to increase the volume.

6 **Input Selector Buttons and Indicators (INPUT SELECTOR)**
These buttons are used to select the desired program source. Buttons on the same level are interconnected; depressing one releases the previously depressed button, so be sure to press only one button at a time. An indicator shows which program has been selected.

PHONO : Turntable connected to the PHONO jacks.
TUNER : Tuner connected to the TUNER jacks.
CD-2 : Compact disc player connected to the CD-2 jacks.
CD-1 : Compact disc player connected to the CD-1 jacks.
SOURCE : Press this button when the input selector has been used to make a lower level section (DAT, TAPE-1/VIDEO, TAPE-2) and an upper level source (PHONO, TUNER, CD-1, CD-2) is desired.
TAPE-2 : Tape deck connected to the TAPE-2 jacks.
TAPE-1/VIDEO : Tape deck connected to the TAPE-1/VIDEO jacks.
DAT : Tape deck connected to the DAT jacks.

NOTE:

Even when the DAT, TAPE-1/VIDEO, or TAPE-2 button has been pressed, the indicator light for the source (PHONO, TUNER, CD-1, CD-2) selected from the upper level will remain lighted. Pressing the SOURCE button will return the unit performance to the source indicated.

7 **Speaker Selector Switch (SPEAKERS)**
This unit can drive two different speaker systems at once. Use this selector to activate either or both speaker systems connected to the rear panel speaker terminals. In the OFF position, sound is heard only through the headphones.
OFF: All speakers off—only headphones operate.
A: Speakers A
B: Speakers B
A + B: Both speaker systems A and B.

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8 Headphone Jack (PHONES)
Stereo headphones with a standard binaural plug can be connected here.

9 Bass Control Knob (BASS)
Turn right to boost or left to attenuate bass. In the DEFEAT position, the bass tone control circuitry is completely bypassed.

10 Treble Control Knob (TREBLE)
Turn right to boost or left to attenuate treble. In the DEFEAT position, the treble tone control circuitry is completely bypassed. When turned to the extreme left (−10), the treble control acts as a high cut filter to eliminate scratches, hissing and other high frequency noise.

11 Balance Control Knob (BALANCE)
Adjust to control the relative volume level of the left and right speakers or headphones.

12 Source Direct Switch (SOURCE DIRECT)
This switch can be used to change the performance source selected with the input selector buttons 6.

TONE: The tone control, muting, balance, and performance mode can be altered for the source selected with the input selector buttons 6.

DIRECT: The volume of the source selected with the input selector buttons 6 can be input directly into the main amplifier. At this time the signal will bypass the tone control, muting, balance, and mode circuits.

13 Recording Source Selector Switch (REC SELECTOR)
DAT or TAPE can be selected by the recording source selector switch.

TAPE-1 ▶ DAT & TAPE-2 / DAT ▶ TAPE-1 & 2: Use either of these settings for tape dubbing operations depending on which deck is being used for playback and which is being used for recording. For details, refer to the Operations section.

OFF: When not recording or dubbing.

SOURCE: Recording from the source selected by the input selector buttons 6 (PHONO, TUNER, CD-1 or CD-2).

14 Cartridge Selector Switch (CARTRIDGE)

MC SUBSONIC: Turntable using an MC cartridge with subsonic filter.

MC: Turntable using an MC cartridge.

MM: Turntable using an MM cartridge.

MM SUBSONIC: Turntable using an MM subsonic cartridge.

Use the MM position when a step-up transformer is being used with a turntable equipped with an MC cartridge.

Operations

Connect all components to the rear panel jacks as shown in the system connections section and set the front panel controls at the appropriate setting to hear the desired program source.

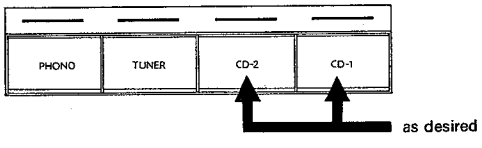
Normal Standby Mode

The standby positions of front panel controls and switches serve as the starting point for all operating modes.

3	Muting Switch	OFF
4	Mode Selector Switch	STEREO
5	Volume Control Knob	minimum (all the way to the left)
6	Input Selector Button	as desired
7	Speaker Selector Switch	as desired
9	Bass Control Knob	DEFEAT
10	Treble Control Knob	DEFEAT
11	Balance Control Knob	Center
12	Source Direct Switch	as desired
13	Recording Source Selector Switch	OFF
14	Cartridge Selector Switch	as desired
1	Power Switch	ON

Listening to a compact disc

1. Press the CD-1 or CD-2 input selector button 6.

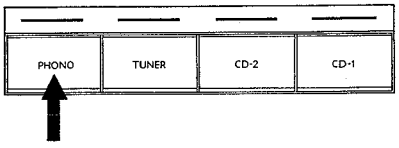


- Press the SOURCE button if the input selector button 6 DAT, TAPE-1/VIDEO or TAPE-2 has been selected.

2. Set the CD player for playback.

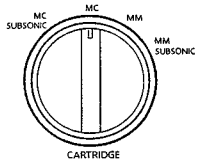
Listening to a record

1. Press the PHONO input selector button 6.



- Press the SOURCE button if the input selector button 6 DAT, TAPE-1/VIDEO or TAPE-2 has been selected.

2. Set the cartridge selector switch 14 to the type of cartridge you are using.

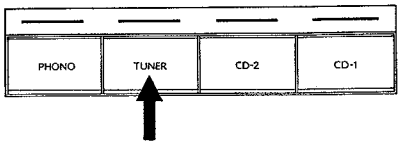


Example:
Using the MC cartridge

3. Set the turntable for playback.

Listening to a broadcast

1. Press the TUNER input selector button 6.



- Press the SOURCE button if the input selector button 6 DAT, TAPE-1/VIDEO or TAPE-2 has been selected.

2. Set the tuner to receive the broadcast that you want to listen to.

NOTES:

- Rotate the volume control knob slowly to find the optimum volume setting.
- Please refer to pages 4 and 5, "Front panel facilities," and adjust the sound quality to your own satisfaction, using the tone control knobs. If necessary, you can also use the balance control knob [11] and mode selector switch [4] for fine tuning.

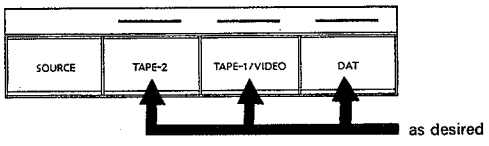
About the Variable Tone Boosting System

This unit is designed to gradually reduce the effect of the tone controls (bass and treble) when the volume exceeds a certain level. The variable boosting system gradually reduces the boosting effect of the bass [9] and treble [10] controls when one or both of these controls is turned beyond (to the right of) the center defeat position and the volume control [5] is turned beyond the center position. When the volume is turned all the way up, the frequency response will be flat again. Volume settings below the center position have no effect on the tone controls. Also, bass and treble control settings below (to the left of) the center defeat position are not altered by the volume level.

Using Tape Decks

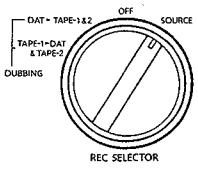
Playback:

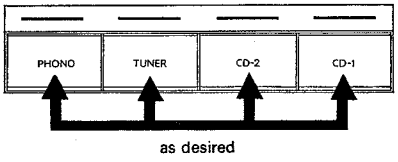
Three tape decks can be connected to this unit at once. If the deck connected to the DAT jack is to be heard, press the DAT input selector button [6]. To listen to the deck connected to the TAPE-1/VIDEO jack, press the TAPE-1/VIDEO input selector button [6]. In the same way, press the TAPE-2 input selector button [6] to listen to the deck connected to the TAPE-2 jack.



Recording on the Tape Deck or DAT from the Program Source (PHONO, TUNER, CD-1 or CD-2).

1. Set the SOURCE position of the recording source selector switch [13].
2. Select the desired recording source with the input selector buttons [6] (PHONO, TUNER, CD-1 or CD-2).





3. Begin tape deck or DAT recording operations.
4. Begin program source performance.

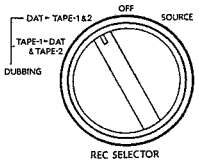
* Be careful not to change the input selector button while recording.

- If you are using a three-head tape deck, setting the input selector button to DAT, TAPE-1/VIDEO or TAPE-2 enables you to monitor the recording conditions.

Tape-to-Tape Duplicating

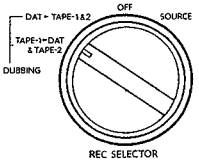
When two or three tape decks are connected to this unit at the same time, a tape can be copied from one deck to the other.

1. To copy a pre-recorded tape from tape deck 1 (connected to the rear panel DAT jacks) to tape deck 2 (connected to the TAPE-1/VIDEO jacks) or tape deck 3 (connected to the TAPE-2).
   Place the recording source selector switch [13] in the DAT ▶ TAPE-1 & 2 position and put tape deck 1 in the playback mode and tape deck 2 or 3 in the recording mode.



If tape deck 2 or 3 is a 3-head deck, the just-recorded signal can be monitored by depressing the TAPE-1/VIDEO or TAPE-2 input selector button [6]. To monitor the signal from tape deck 1 before it has been recorded, press the DAT input selector button [6]. Press one of the other input selector buttons to listen to the CD player, turntable, tuner or auxiliary component while dubbing is taking place.

2. To copy from tape deck 2 (connected to the TAPE-1/VIDEO jack) to tape deck 1 (connected to the DAT jack) and tape deck 3 (connected to the TAPE-2 jack).
   Place the recording source selector switch [13] in the TAPE-1 ▶ DAT & TAPE-2 position and put tape deck 1 or 3 in the recording mode and tape deck 2 in the playback mode.

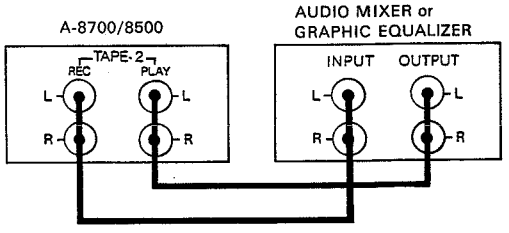


If tape deck 1 or 3 is a 3-head deck, the just-recorded signal can be monitored by pressing the DAT or TAPE-2 input selector button [6]. Press one of the other input selector buttons to listen to the CD player, turntable, tuner or auxiliary component while dubbing is taking place.

- Dubbing cannot be done from tape deck 2 (connected to the TAPE-2 jacks) to tape decks 1 or 3 (connected to the DAT or TAPE-1/VIDEO jacks).

Using a Mixing Console or Graphic Equalizer

A mixing console or graphic equalizer can be connected to the TAPE-2 jack as shown in the diagram. The input selector is then set to the TAPE-2 setting.



To Equalize an Audio Source for Playback

1. Select the desired listening source with the input selector button [6] (PHONO, TUNER, CD-1 or CD-2) and set the recording source selector switch [13] to the SOURCE position.
   When using an equalizer on the DAT signal, set the recording source selector swith to DAT ▶ TAPE-1 & 2. When using an equalizer with the deck connected to the TAPE-1/VIDEO jack, set it to TAPE-1 ▶ DAT & TAPE-2.
2. Press the TAPE-2 input selector button [6].
3. Begin performance.

- When the source direct switch is set at TONE, tone control, muting, mode, and balance functions can all be adjusted from this unit.

NOTE:

When recording something that has been sent through an equalizer, use an equalizer which is equipped with equalizing recording capacity.

E

Troubleshooting guide

Trouble	Cause	Remedy
No power.	• AC fuse blown.	• Contact your authorized ONKYO service center.
Power on but no sound.	• Bad connections.	• Check input leads, speaker leads, pin plugs, etc.
Hum, low frequency noise.	• Poor or no input ground. • Poor or no phono motor ground.	• Check outer conductor of input plugs. • Check for proper ground connection.
Howling when the volume is turned up.	• Turntable and speakers are too close together.	• Move them farther apart.
Rough or schatchy sound. High range is not clear.	• Stylus of pick-up is worn. • Stylus is dirty. • Treble control is too high.	• Replace. • Clean. • Turn treble control down.

Specifications

A-8700

Continuous Power Output:	2 x 160 watts at 4 ohms, 1 kHz (DIN) 2 x 115 watts at 8 ohms, 1 kHz (DIN) 105 watts per channel, min. RMS, at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.008% Total harmonic distortion.	
Dynamic Power:	303 watts at 2 ohms, 235 watts at 4 ohms	
Total Harmonic Distortion	0.008% at rated power 0.008% at 1 watt output	
Intermodulation Distortion:	0.005% at rated power	
Damping Factor:	150 at 8 ohms (1 kHz)	
Input Sensitivity/ Impedance:	Phono (MM):	2.5 mV/50 kohms
	Phono (MC):	160 µV/130 ohms
	CD:	150 mV/30 kohms
	TUNER:	150 mV/30 kohms
	Tape Play:	150 mV/30 kohms
Output Level/Impedance:	Tape Rec:	150 mV/1.0 kohms (Phono)
Phono Overload:	Phono (MM):	200 mV RMS. at 1 kHz, 0.012% THD.
Tone Control (Vol −20 dB):	BASS:	±8 dB at 100 Hz
	TREBLE:	±8 dB at 10 kHz
High Cut:	6 kHz (6 dB/Octave) (TREBLE min.)	
Frequency Response:	CD, Tuner:	2 Hz−50 kHz (+0, −1 dB)
RIAA Deviation:	Phono (MM):	±0.3 dB, 20 Hz −20 kHz
Subsonic Filter (MM SUBSONIC, MC SUBSONIC):	20Hz (−3dB, 6dB/Oct)	
Signal to Noise Ratio (IHF-A):	Phono (MM):	94 dB (5.0 mV input)
	Phono (MC):	75 dB (0.5 mV input)
	CD (DIRECT):	107 dB
Muting:	−20 dB	
Power Supply:	European models:	AC220V, 50 Hz
	Canadian models:	AC120V, 60 Hz
	U.K & Australia models:	AC240V, 50 Hz
	Worldwide models:	AC120 and 220V switchable, 50/60 Hz
Dimensions (W x H x D):	435 x 157 x 391 mm 17-1/8" x 6-3/16" x 15-3/8"	
Weight:	13.5 kg, 29.8 lbs.	

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Continuous Power Output:	2 x 120 watts at 4 ohms, 1 kHz (DIN) 2 x 90 watts at 8 ohms, 1 kHz (DIN) 80 watts per channel, min. RMS, at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.008% Total harmonic distortion.	
Dynamic Power:	210 watts at 2 ohms, 167 watts at 4 ohms	
Total Harmonic Distortion	0.008% at rated power 0.008% at 1 watt output	
Intermodulation Distortion:	0.005% at rated power	
Damping Factor:	150 at 8 ohms (1 kHz)	
Input Sensitivity/ Impedance:	Phono (MM):	2.5 mV/50 kohms
	Phono (MC):	160 µV/130 ohms
	CD:	150 mV/30 kohms
	TUNER:	150 mV/30 kohms
	Tape Play:	150 mV/30 kohms
Output Level/Impedance:	Tape Rec:	150 mV/1.0 kohms (Phono)
Phono Overload:	Phono (MM):	180 mV RMS. at 1 kHz, 0.015% THD.
Tone Control (Vol −20 dB):	BASS:	±8 dB at 100 Hz
	TREBLE:	±8 dB at 10 kHz
High Cut:	6 kHz (6 dB/Octave) (TREBLE min.)	
Frequency Response:	CD, Tuner:	2 Hz −50 kHz (+0, −1 dB)
RIAA Deviation:	Phono (MM):	±0.3 dB, 20 Hz −20 kHz
Subsonic Filter (MM SUBSONIC, MC SUBSONIC):	20Hz (−3dB, 6dB/Oct)	
Signal to Noise Ratio (IHF-A):	Phono (MM):	93 dB (5.0 mV input)
	Phono (MC):	74 dB (0.5 mV input)
	CD (DIRECT):	107 dB
Muting:	−20 dB	
Power Supply:	European models:	AC220V, 50 Hz
	Canadian models:	AC120V, 60 Hz
	U.K & Australia models:	AC240V, 50 Hz
	Worldwide models:	AC120 and 220V switchable, 50/60 Hz
Dimensions (W x H x D):	435 x 157 x 391 mm 17-1/8" x 6-3/16" x 15-3/8"	
Weight:	12.5 kg, 27.6 lbs	

Specifications and features are subject to change without notice.